



Evaluation #

200435-B (Replaces 990023-B)

Safety & Buildings Division
201 West Washington Avenue
P.O. Box 2658
Madison, WI 53701-2658

Wisconsin Building Products Evaluation

Material

Telescopic Bleachers

Manufacturer

INTERKAL, LLC
5981 East Cork Street
Kalamazoo, MI 49048

SCOPE OF EVALUATION

GENERAL: This report evaluates the interior telescopic bleachers manufactured by Interkal, LLC.

The IBC requirements below in accordance with the current **Wisconsin Amended ICC Code**:

- **Egress Width (general):** The interior telescopic bleachers have been evaluated for conformance in accordance with ss. **IBC 1003.2.3** and **1003.2.8**.
- **Egress Required Aggregate Width for A-4 Assembly:** The interior telescopic bleachers were evaluated in accordance with s. **IBC 1008.5**.
- **Guardrails:** The interior telescopic bleacher guardrails have been evaluated in accordance with s. **IBC 1003.2.12**, **Exception 7**, and s. **IBC 1008.12**.
- **Bleacher Foot boards:** The interior telescopic bleacher foot boards were evaluated in accordance with s. **IBC 1008.13**.
- **Bench Seating:** The interior telescopic bleacher bench seating was evaluated in accordance with s. **IBC 1008.14**.
- **Bleacher Structure:** The interior telescopic bleachers are designed and constructed in accordance with s. **IBC 1604.1**, s. **IBC 1604.2** and s. **IBC Table 1607.1**.

DESCRIPTION AND USE

GENERAL: The Model 2001 14, 17, 18, 19 and 20 row, wall attached bleachers and telescopic bleacher systems are fabricated from steel (framing), and wood seats and risers, and plastic (seating modules of high density polyethylene).

Materials include the following configurations of telescopic bleacher seating:

- 3 to 20 row wall attached bleachers 10 1/4" rise, 22" - 26" span with maximum 26' -0" section.
- 3 to 19 row wall attached bleachers 10 1/4" rise, 30" - 33" span with maximum 23' -0" section.

- 3 to 14 row wall attached bleachers 16" rise, 22" - 26" span with maximum 23' -0" section.
- 3 to 18 row wall attached bleachers 11 1/2" rise, 22" - 26" span with maximum 26' -0" section.
- 3 to 17 row wall attached bleachers 11 1/2" rise, 30" - 33" span with maximum 23' -0" section.
- Wood, Vinyl-on-steel, plastic CSM & SSM seating.
- Self-storing and removable guardrail system.
- Center Aisle Handrails, 'P' shaped and self-storing.

Load transfer to building floors and wall: The bleacher assembly must support live and dead loads in the open position, as well as dead loads in the closed position. In the open position live and dead loads will be transferred through the seats and decks to the rear and nose beams of the bleacher. The decks will be supported by deck supports and support post cantilevers and returns on rear and nose beams. The deck supports also provide bracing for the rear beam. The decking continuously braces the rear and nose beams. The loads from the beams will be transferred through the cantilevers to the posts. The posts will transfer their loads to the wheel channels. The wheel channels will transfer the load through axles and wheels to the floor. The weak axis of the posts in rows 2 and higher is braced against lateral loads with knee style bracing. The bracing resists the 24 pounds per linear foot sway load on the bleacher. The bracing can take load in compression and tension. The 10 pounds per linear foot load acting perpendicular to the platform will be transferred through the platform supporting components and into the wall for wall-attached bleachers.

Design considerations: The support structure for every row is virtually identical. The only relevant variables are the length of the two support posts, the distance they are separated, and the distance the deck overhangs the support post locations. Since there is a common section for all posts, and a common section for all beams, certain post and deck configurations will govern the design of the beams and posts. These design critical load combinations will be analyzed to verify the adequacy of the design. Both sections are the same size and utilize the same support structure. One section will be analyzed to verify the adequacy of the bleacher design.

Wall anchorage: the wall anchoring system provided by Interkal, LLC., when located in accordance with the Wall Buck

Anchor Location - Manual, provides adequate anchorage when attached to solid concrete or light-weight concrete block. For wall anchoring other than concrete or block, details and calculations must be provided upon plan submittal.

Floor anchorage: floor and wall anchorage is not covered under this approval number. See **LIMITATIONS OF APPROVAL** section.

Main framing members: 14-gauge galvanized steel rear beam and channel braces, 13-gage galvanized steel nose beam, structural steel angles, and 2-inch by 3-inch, or 2-inch by 4-inch structural steel tubing in 14- or 11-gauge thickness.

Wood seat boards: Seats and front risers are dense Southern yellow pine, Grade B with a B finish. A 4/4-inch nominal thickness, kiln dried, finger joined and edge glued; all boards smooth sanded, and sealed with a moisture resistant urethane and finished with a second coat of high gloss urethane; 22-, 24-, 26-, 30-, 32- and 33-inch back-to-back spacing.

- **Sculpture:** The seats are 18-inch wide individual seating modules of high-density polyethylene structural foam with five vertical and two lateral ribs inside each module to provide strength. The modules contain both perimeter and interval interlocks. End caps are provided at each end of all seating runs. The 10-inch deep modules are standard on telescopic seating with 22-, 24-, 26-, 30-, 32- and 33-inch back-to-back spacing. The 12-inch deep modules are not allowed for use on telescopic seating with 22- inch back-to-back spacing.
- **Vinyl-on-steel:** A one piece vinyl-clad formed 16-gauge steel and 8 mil vinyl surface seat add stability to the system; available in 22-, 24-, 26-, 30-, 32- and 33-inch back-to-back spacing.

Deck construction: full platform plywood closed deck, 5/8-inch nominal CD Grade with solid cross band; finished with .025-inch to .030-inch thick polyethylene laminate.

Aisle handrails: Are easily dismounted, 34-inches high 'P'-shaped rail. (Per s. IBC 1008.11, are required by code.

Note: Aisle handrails shall not obstruct/impede exiting from bleachers and shall be discontinuous at intervals not exceeding 5 rows to facilitate access to seating and permit crossing from one side of the aisle to the other).

End rails: Are removable and self storing, non-removable, both all steel construction, 42-inches high with mid-rails that prevent passage of a sphere four inches in diameter.

Back rails: 42-inches high tubular steel top rail, heavy gauge steel mid-rails prevent passage of a sphere four inches in diameter.

Guardrails are constructed to prevent the passage of a sphere larger than 4-inches in diameter. In accordance with **s. IBC 1008.12**, when bleachers have more than one pull out section, the plan submittal shall show end guardrails at each section (or sockets for installation of guardrails per section), or designed such that individual bleacher sections **cannot** be extended without extending the rest of the sections. Guardrail design and placement shall comply with the requirements of **s. IBC 1008.12**. Guarding between the foot boards and seat boards is also required.

All bleachers must be provided with aisles, in accordance with **s. IBC 1008.7**. **Exiting via the seat boards is not permitted.**

The occupant capacities of buildings and rooms within buildings are established by exit width, toilets and the class of construction of the building. The capacity of the bleachers **cannot exceed** the allowable capacity of the room or building.

Aisle widths located within the bleachers are determined by **s. IBC 1008.5**, or use the minimum in **s. IBC 1008.7.1**.

This approval does not address barrier-free requirements. Accessible seating in accordance with the applicable requirements in **IBC Chapter 11** shall be reviewed during building plan review.

This approval is not for an individual project, but for the design concept only. Plans are required for each project showing the approval number, member sizes, wall and floor anchoring information, guardrail details, size and location of bleacher aisles and construction details required to construct the bleachers from the plans.

CALCULATIONS

Static load analysis in accordance with the applicable design procedures in **IBC Chapter 16** of current **Wisconsin Amended ICC Code**. See **IBC Table 1607.1** and NFPA 102 for static loads for the bleachers and railings (also **s. IBC 1607.7**). Allowable stresses for beams, posts, cantilevers, deck supports, and wheel channels will be determined with the AISI Cold Formed Steel Design Manual. Computer programs were used to determine section properties and the allowable stress for most components of the bleacher support structure. The design will be by Allowable Stress Design Method unless noted otherwise.

Design Loads:

- Dead Load: Weight of bleacher.
- Uniform Live Load: A uniformly distributed vertical live load of not less than 100 pounds per square foot of gross horizontal projection **s. IBC Table 1607.1, 28**.
- Seat and foot board Live Load: 120 lb./ft **s. IBC Table 1607.1, Note c**.
- Horizontal Sway: Parallel to seats (deck length), 24 pounds per lineal foot **s. IBC Table 1607.1, Note c**.
Perpendicular to seats (deck length), 10 pounds per lineal foot **s. IBC Table 1607.1, Note c**.
- Handrails: 200 lb. any direction **s. IBC Table 1607.1.1**.
- Guardrails: 200 lb. any direction **s. IBC Table 1607.1.1**.
- Guardrail In-Fill Area: 50 Lbs. on 1 ft² **s. IBC 1607.7.1.2**.

Structural calculations for Interkal, LLC telescopic bleachers were prepared by a P.E., WI. (signed and sealed) and drawings are on file with the department. Deck performance calculations are also on file with the department.

LIMITATIONS OF APPROVAL

The **IBC** limitations below are in accordance with the current **Wisconsin Amended ICC Code**:

Except as noted below, calculations and drawing details shall be submitted on a job-to-job-basis showing floor and or wall anchorage loads and how attached, respectively, in accordance with **s. Comm 61.30**.

In accordance with **s. Comm 61.30**, anchorage details shall be shown on the plans indicating how folding bleachers are attached to the wall and floor. If installation is in an older building, (more than 4 years old), bleacher plans shall show the construction of the wall and/or floor to which the bleacher section will be anchored. This material approval also waives anchorage calculations to solid concrete walls and lightweight concrete block only (see **DESCRIPTION AND USE** section). Both wall/floor anchorage details shall be shown on plans on a job-to-job basis. Wall anchorage details and calculations are required for wall anchorage to wood stud/drywall, etc., on a job-to-job basis.

Interkal interior telescopic bleachers are approved for plan submittal without structural calculations showing that dead and live load support for open or partially opened and dead load in the closed position, can be safely carried by the supporting structure in accordance with **s. Comm 61.30**.

Additional information required with plans submitted on a job-to-job basis:

Where the rise of a seat exceeds 11-inches, intermediate steps shall be provided the full width of the aisles. The steps shall have a rise of not more than 11-inches and a tread of not less than 10-inches nominal width. In no case shall the angle of seating exceed 45 degrees. Per **s. IBC 1008.9.2**, the maximum riser height is 8". Per **s. IBC 1008.9.3** the minimum tread width is 11". The resulting maximum slope is 8 on 11 or 36 degrees.

This approval will be valid through December 31, 2009, unless manufacturing modifications are made to the product or a re-examination is deemed necessary by the department. The product approval is applicable to projects approved under the current edition of the applicable codes. This approval may be void for project approvals made under future applicable editions. The Wisconsin Building Product Evaluation number must be provided when plans that include this product are submitted for review.

DISCLAIMER

The department is in no way endorsing or advertising this product. This approval addresses only the specified applications for the product and does not waive any code requirement not specified in this document.

Revision Date:

Approval Date: January 28, 2005 By: _____

Lee E. Finley, Jr.
Product & Material Review
Integrated Services Bureau